

nently electrical state, and that, therefore, thunderclouds in our atmosphere ought to be attracted to or repelled from it, and move accordingly, Sir John Herschel remarks, that while the matter of a cloud is vastly more dense than that of a comet, the latter, in all probability, is more powerfully excited than the cloud; and hence, on both these grounds, the motion of the cometic particles ought to be inconceivably swifter than the motion of the cloud. The argument is still further strengthened by the consideration that the cloud moves through a medium which is infinitely denser than that traversed by the comet. It is interesting to find Hooke endeavouring to support his theory by means of an argument closely resembling that which is here employed by Sir John Herschel.*

The views entertained by Bessel respecting the origin of the luminous emanations are somewhat similar to those of Sir John Herschel, as above stated.

With respect to the remarkable appearances which Hooke observed in the comet of 1680, he states that he had never met with any mention of similar phenomena in any author or from any person who had devoted his attention to comets. He adds, however, that he had been told by "*some antient men*" who had seen the great comet of 1618, that it did perfectly sparkle and shoot fire, but he was disposed to attribute this notion to the exaggerated effect produced upon the imagination by the terrific aspect of the comet.

On the Zodiacal Light. By the Rev. T. W. Webb.

The following memoranda of former appearances of the zodiacal light may, perhaps, be thought worthy of preservation, at any rate so far as they may exhibit some correspondence with the observations of Mr. Lowe, in the *Monthly Notices* for November.

"1837, Feb. 23. I think it was about 7^h 30^m, but I am not confident as to the time that I saw the zodiacal light, extending as far as the *Pleiades*, its termination, which was very faint, being, I think, a little to the south of them.

"March 7. About 7^h 50^m, the zodiacal light was again visible, tolerably bright near the horizon, but faint at a greater elevation. It seemed, however, to extend as far as the *Pleiades*, and a little beneath them.

"1839, Jan. 9. The zodiacal light was very visible about 6^h 30^m p.m., but not well defined; the base was broad, and the point directed towards *Aries*. Its exact extent could not be ascertained, but by oblique vision, by which it was best seen, it appeared to extend beyond, and beneath, γ *Pegasi*.

* "And though the progress of the flash in comets be probably a thousand times more swift; yet considering the vast difference there is between the air and the ether, I know not but that the progress of the ascension of flame in the lightning may be accounted as quick through the thick medium of air, as that of the comet in the thinner and more fluid medium of ether."—(*Posthumous Works*, p. 170.)

"Jan. 17. Zodiacal light very conspicuous about $6^h 30^m$. It appeared by oblique vision to extend nearly as far as the stars in *Aries*.

"1842, Dec. 27. About $6^h 15^m$ the zodiacal light was noticed, which soon afterwards became more distinct, and was watched until after 7^h . It extended from the horizon in a direction towards, or a little beneath, the stars of *Aries*, which, however, it did not reach, becoming invisible under the quadrilateral of *Pegasus*. Its termination, however, as well as its edges, was exceedingly ill defined. It was brighter than the faintest, but fainter than the brightest portions of the galaxy, and of a different tint, not so pure and ethereal, but more inclined to yellow. The suspicion so continually recurred, as almost to give the impression of certainty, that, like the tail of some comets, it had a less luminous space in the centre. This was not noticeable in the broader base, but began to appear some degrees above the horizon, and was feebly traced throughout its length. It seemed as though the cone were composed of two converging rays, inclined to one another at an angle of about 5° or 10° , and it appeared as though the lower one, or that towards the south, were broader than the other.

"1843, Jan. 1. About 6^h p.m., the zodiacal light began to be noticed, and was watched for about 30^m . It seemed rather brighter than on Dec. 27, 1842, so as to be somewhat brighter than the more luminous parts of the galaxy. Its direction and extent, and the ill-defined character of its edges and summit, were much as upon that occasion, and the same suspicion again returned as to its being composed of two streams or rays.

"1843, Jan. 22. A beautiful zodiacal light, in a very clear evening, between 6^h and $6^h 45^m$, extending nearly to the stars of *Aries*; ill defined, but brighter than any visible part of the galaxy, and of a yellower tinge. The suspicion of its being double would probably not have occurred, certainly not to any one uninformed as to previous appearances.

"1843, Jan. 30. Fine but ill-terminated zodiacal light. It might easily have been fancied double by any one who wished to find such a phenomenon; but if it exists, I am sure it is less perceptible by far than on Dec. 27.

"1843, March 18. Zodiacal light noticed about 8^h p.m. as a low, broad, ill-defined cone in the west. It seemed to extend nearly to the *Pleiades*.

"1843, March 24. Zodiacal light about 8^h p.m.; a broad, conspicuous, ill-defined cone, extending to or beyond the *Pleiades*.

"1843, March 29. After evening twilight, the zodiacal light was conspicuous as a broad, ill-terminated cone, reaching further than the *Pleiades*, and probably touching the skirts of the galaxy, its configuration with which presented a beautiful and interesting spectacle. Later, there was an auroral light, somewhat further on than the place of the now fading zodiacal light, which for a short time seemed to send up a few faint short streamers. The zodiacal light was this evening considerably brighter than the Milky Way.

"1850, March 11. Broad and bright, but ill defined, and I think, patchy, zodiacal light, extending to the *Pleiades*.

"1850, Dec. 23. Between 7^h 30^m and 8^h p.m., there was much diffused light along the west horizon, extending from the setting of the galaxy 40° or 50° towards the south. It had not at all the appearance of the aurora borealis, but much more the aspect of another form of zodiacal light, a faint beam of which seemed to stream upwards through the region of ζ *Aquarii* towards *Saturn*. It struck me as being very probably a greatly foreshortened projection of this light, which, if this is the case, will shortly become visible in its lenticular form.

"1852, Jan. 17. As twilight disappeared, the zodiacal light began to be visible; fainter than the galaxy, but extending beneath and beyond the stars of *Pegasus*, and nearly as far as *Aries*; its edges and termination were, however, exceedingly ill defined. A suspicion was entertained that it consisted of several separate, though not distinct, streams. Later, perhaps about 6^h 30^m, its lower and broader part was very conspicuous, twilight having now disappeared, and it there seemed to be much brighter than the Milky Way. Its further condition could not be observed.

"1853, Feb. 26. The zodiacal light was beautifully seen at and after 7^h 45^m. It appeared as a pillar of diffused light, extending beyond the stars of *Aries*, but very ill defined at its sides and termination. It did not appear, at first, to be much inclined to the horizon; as it sank lower, it was fancied to be more so. Its centre appeared more luminous than its edges, and far brighter than any visible portion of the galaxy, so as to be a conspicuous object.

"March 8. The zodiacal light was again very splendid about 7^h 45^m. A tapering prolongation appeared to the averted eye to extend nearly to the *Pleiades*.

"*Tretire*, Dec. 28, 1853."

On a newly-invented Portable Equatoreal. By Mr. William Rothwell.

This instrument consists of a telescope 14 inches in length, carrying the hour-circle at the eye-end, and turning on cylindrical collars in uprights securely fixed to a brass pillar attached to an horizontal plate, so that the telescope, which is the polar axis, has an inclination equal to the latitude of the place, when the plate is levelled by the three foot-screws, provided for that purpose; there is also a pair of antagonist screws which give the whole of the instrument a movement in azimuth, and serve to place the instrument upon the meridian.

Below the telescope is an horizontal axis, supported upon two uprights in the usual manner, the western pivot of which carries the declination-circle, and is furnished with a level and the usual adjustments appertaining to the finding circle of a transit instrument; this axis in rotating carries with it, directly under the telescope, a plane mirror, whose surface is adjusted parallel to the declination